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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/925,884	08/06/2001	Michael Kenny	259/079	7035

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PERKINS COIE LLP/SEMITOOL  
PO BOX 1208  
SEATTLE, WA 98111-1208

EXAMINER
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EL ARINI, ZEINAB

ART UNIT	PAPER NUMBER
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1746

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/22/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

### Application No.

09/925,884

### Applicant(s)

KENNY ET AL.

### Examiner

Zeinab E. EL-Arini

### Art Unit

1746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 November 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10,12-14,17,20,22,24-29,37,39 and 41-45 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10,12-14,17,20,22,24-29,37,39 and 41-45 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 10/09/06.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

The amendment and remarks filed 11/29/06 have been acknowledged and entered.

The objection to the specification stated in paper No. 20060830 has been withdrawn in view of applicants' amendment.

#### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-10, 12-14, 17, 20, 22, 24 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification, as originally filed, does not provide support for "forming a boundary layer of a heated liquid on the bottom surface of the workpiece as now claimed.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-7, 9-10, 12-14, 17, 22, 24-29, 37, 39, and 41-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Torek et al. (6,758,938) in combination with DeGendt et al. (US 2002/0011257 A1) and Sasaki et al (5,785,068) and Boyers et al. (6,982,006 new reference).

Torek et al. disclose a method for stripping a layer from a semiconductor wafer. The method comprises introducing ozone into a process chamber and activating a water spray for a first predetermined amount of time, thereby creating a water layer on a semiconductor wafer, wherein the water layer transport high concentrations of the ozone to the semiconductor wafer. The reference discloses controlling a thickness of the water layer. The reference discloses rotating the workpiece. The reference also discloses spraying heated water and forming a boundary layer of a heated liquid. See col. 2, lines 7-57; col. 3, lines 20-26, col. 5, lines 38-45, col. 7, lines 19-65.

Torek et al. teach all limitation with the exception of moving the liquid jet at speed sufficient to penetrate through the boundary layer, and the sonic energy, and directing a liquid jet at the bottom surface of the spinning workpiece, and forming a boundary layer of a heated liquid on the bottom surface of the workpiece as claimed.

DeGendt disclose a method of removing organic contaminant from a workpiece.

The method comprises, forming a layer or film of heated liquid on the workpiece, rotating the workpiece, controlling the thickness of the liquid layer on the surface of the workpiece, subjecting the solution to megasonic agitation (see claim 16), and

introducing ozone gas into the process chamber with the ozone gas diffusing through the layer. See paragraphs 79 and 80. The reference also discloses rinsing the workpiece.

Sasaki et al. disclose a method and apparatus for cleaning a substrate. The method comprises directing liquid jet at a substrate, and moving the liquid jet to dislodge the contaminants from the substrate. See the abstract, Fig. 1, col. 1, lines 5-17, 51-67, and col. 3, lines 9-38.

Boyers et al. disclose a method and apparatus for treating a substrate. The reference discloses directing a liquid jet at the bottom surface of the spinning workpiece. See the abstract, and Fig. 6.

Boyers et al. do not teach forming a boundary layer as claimed.

It would have been obvious for one skilled in the art to use the megasonic taught by DeGendt et al. in the Torek et al. process to enhance the cleaning process. It would have been obvious for one skilled in the art to use the liquid jet, and spinning substrate, taught by Sasaki et al. in the Torek et al. in combination with DeGendt et al. process to enhance the cleaning process, by dislodging the contaminants from the surface of the substrate. It would have been obvious for one skill in the art to use the spraying taught by Boyers et al. in the Torek et al. process to enhance the cleaning process. Forming boundary layer on the bottom surface of the substrate is inherent in Boyers et al. process.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Torek et al. (6,758,938) in combination with DeGendt et al. (US 2002/0011257 A1), Boyers et al. (6,982,006 new reference) and JP 11-300301 (JP'301).

Torek et al. in combination with DeGendt et al. and Boyers et al as discussed supra do not teach introducing the sonic energy as claimed.

JP'301 discloses a method of washing a substrate in which washing liquid with ultrasonic waves is fed from a nozzle 11 to the rear of a substrate W whose surface is covered with a liquid film to wash it See the abstract.

It would have been obvious for one skilled in the art to use the sonic energy taught by JP'301 in the Torek et al. in combination with DeGendt et al. and Boyers et al. process to enhance the cleaning process.

1. Claims 1-2, 8, and 12-14, and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeGendt et al. (257) in combination with Sasaki et al. and Boyers et al.

DeGendt disclose a method of removing organic contaminant from a workpiece.

The method comprises, forming a layer or film of heated liquid on the workpiece, rotating the workpiece, controlling the thickness of the liquid layer on the surface of the workpiece, subjecting the solution to megasonic agitation (see claim 16), and introducing ozone gas into the process chamber with the ozone gas diffusing through the layer. The reference discloses rotating the substrate at high speed. See paragraphs 79 and 80. The reference also discloses rinsing the workpiece.

The reference discloses all limitation with the exception of directing a liquid jet, and forming boundary layer of a heated liquid on the bottom surface of the workpiece, and the angle as claimed.

Sasaki et al. as discussed supra disclose directing the liquid jet as claimed. Sasaki et al. disclose the nozzle angle being variable relative to the substrate. The reference discloses the optimal angle. See col. 2, lines 1-17.

Boyers et al. as discussed supra disclose a method and apparatus for treating a substrate. The reference discloses directing a liquid jet at the bottom surface of the spinning workpiece. See the abstract, and Fig. 6. Forming a boundary layer is inherent in Boyers et al. process.

It would have been obvious for one skilled in the art to use the liquid jet taught by Sasaki et al. and Boyers et al. in the DeGendt et al. process to improve the cleaning process. One skilled in the art would adjust the speed of rotation to obtain optimum results.

### ***Response to Arguments***

2. Applicant's arguments with respect to claims 1-10, 12-14, 17, 20, 22, 24-29, 37, 39, and 41-45 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

3. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zeinab E. EL-Arini whose telephone number is (571) 272-1301. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on (571) 272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

*Zeinab E. EL-Arini*  
Zeinab E. EL-Arini  
Primary Examiner  
Art Unit 1746

ZEE  
02/18/07